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ON THE EX-DATE BEHAVIOUR OF BONUS SHARE ISSUES IN AUSTRALIA

by

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I. Introduction

Recent U.S. evidence documents two apparent anomalies in the ex-date behaviour of security returns for stock dividends and stock splits. First, positive abnormal returns occur on the ex-date, and second, the volatility of returns after the ex-date differs from that before the ex-date.

For a sample of stock dividends (distributions of less than 25 percent), Woolridge (1983) found that stock prices did not fully adjust for the stock dividend on the ex-date and that abnormal returns were greatest for small stock dividends of 6 percent or less. Eades, Hess and Kim (1984) found significant positive excess returns on the ex-date for a pooled sample of splits (distributions of 25 percent or greater) and stock dividends. Grinblatt, Masulis and Titman (1984) studied both announcement date and ex-date effects of stock splits and stock dividends of 10 percent or more. They found announcement day returns greater for stock dividends than for stock splits and interpreted their results as consistent with the 'retained earnings hypotheses': stock dividends are deducted from retained earnings and firms that anticipate increased earnings will not find it costly, in terms of ability to pay cash dividends, to reduce retained earnings. Positive ex-date returns were also found for both categories, but were larger for stock dividends than for splits. No explanation was found for this anomaly. Lakonishok and Vermaelen (1986) also found significant positive ex-date returns and a decline in ex-date trading volume for a pooled sample of splits and stock dividends.

Ohlson and Penman (1985) found an increase in volatility of returns for stock splits of 100 percent or greater following the ex date. More recently Dravid (1987) confirmed this result for a sample of splits greater than 25 percent, but found a decrease in volatility following the ex-date for stock dividends. He concluded that stock dividends and splits are not similar events of different magnitudes and interpreted this as evidence supporting the 'retained earnings hypotheses'.

This note investigates returns around the ex-date for a sample of bonus share issues made by firms traded on the Australian Associated Stock Exchanges.[1] A bonus share issue is a free distribution to existing shareholders made via a transfer from a reserve account to paid capital account. Because of Australian tax laws, bonus issues have almost invariably been made out of either or both a share premium reserve account, created when shares were issued at a premium over their par value at some prior time, or an asset revaluation reserve account, created by revaluing assets in the balance sheet above their historical cost, rather than out of retained earnings[2]. Further, bonus issues are not restricted in size by either generally accepted accounting principles or stock exchange rules and bonus issues of greater than 25 percent have been common in Australia.

II. Data

All bonus issues made between July 1981 and June 1986 were collected for firms listed on the Australian Associated Stock Exchanges, a total of 613 bonus issues. To construct a sample of 'clean' ex-bonus date events, we eliminated all cases where the ex-bonus date coincided with the ex-date for a cash or rights issue, an issue of options or warrants, a capital

reconstruction, or a cash dividend. We also required that there be an actual traded share price in each of the periods 5 days before and 5 days subsequent to going ex-bonus. This left us with a sample of 120 'clean' ex-bonus dates.

Daily closing share prices were collected for each of the 15 days prior and subsequent to the ex-date, and also for the ex-date, subject to the following qualification.[3] To eliminate potential contaminating events in the pre- and post-ex-date periods, returns were calculated prior to the ex-date only back to the first traded day subsequent to the announcement of the bonus (or simultaneous) issue, the announcement of earnings or dividends, or an ex-date for cash dividends when one of these events occurred in the 15 day period. Similarly, returns were calculated up to the last traded day before one of these events if it occurred in the post ex-bonus date period.[4] Because of this, the sample size decreases as we move back and forward from the ex-bonus date. All prices had to result from an actual trade, and all individual returns of 5 percent or greater were checked for errors.

III. Ex-Date Returns

The average percentage rates of return and the cumulative average returns for the period surrounding the ex-date in event time, with day 0 defined as the ex-date, for our sample of 'clean' ex-bonus dates are in Table 1. Also shown are the daily cross-sectional t statistics and the percentage of daily returns which were positive, zero or negative. The cumulative average return is also shown in Figure 1.

The average return on the ex-date is 1.74 percent, with a statistically significant t-statistic of 3.88, compared to an average daily return of approximately 0.3 percent in the pre-event period and almost zero in the post-

even period. Further, 58.3 percent of ex-date returns are positive, which is unusually large compared to the incidence of positive returns on the other days in the pre- and post- ex-date periods. Positive average returns are also evident in the period prior to the ex-date.[5] Large positive returns could have been earned by purchasing on the bonus issue announcement date and holding through the ex-date.[6]

The positive ex-date return does not appear to be due to day-of-the-week effects. Jaffee and Westerfield (1985) found negative returns on Monday and Tuesday in Australia and positive returns on the other week-days, with largest returns on Thursday and Friday. For our sample, 50.9 percent of ex-dates occurred on Monday and Tuesday, and 15.8 percent, 20 percent and 13.3 percent on Wednesday, Thursday and Friday, respectively.

Table 2 shows the ex-date return by size of bonus issue, arbitrarily divided into issues of 12.5 percent and less, greater than 12.5 percent and up to 25 percent, and greater than 25 percent. Also shown is the price drop-off ratio defined as:

$$\text{drop-off} = \frac{\text{Cum Price - Ex Price}}{\text{Cum Price } (s/(1 + s))}$$

where s is the size of the issue. The theoretical or full price adjustment on the ex-date would show a drop-off ratio of 1.0.

Significant positive returns occur on the ex-date for the two smaller size categories, but not for bonus issues of greater than 25 percent. The drop-off ratios show that the price adjustment on the ex-date became closer to the theoretical adjustment as the size of the bonus issue increased.[7] This is consistent with Woolridge's (1983) conjecture that ex-date stock prices do not fully adjust to smaller stock dividends. The result is also consistent with that of Grinblatt, Masulis and Titman (1984) in that distributions of less

than 25 percent showed greater ex-date returns than those of greater than 25 percent. However, in contrast to their result, distributions of greater than 25 percent did not show returns significantly different to zero. Note again that there is no difference in accounting treatment in Australia for bonus issues of greater or less than 25 percent.

Table 3 shows the ex-date returns for the sample divided into three equally sized groups ranked on the dollar value of the ex-bonus share price. For the smallest ex-bonus price group, the ex-date return is large, 3.12 percent, and significant. The average ex-date return decreases for the larger dollar price per share categories and the drop-off ratio increases for each successively larger price category.

We further classified ex-date returns by size of firm, defined as the total market value of outstanding shares. Although they did not explicitly investigate ex-date returns by size of firm, Grinblatt, Masulis and Titman's (1984) results do suggest that ex-date returns were related to firm size. From their Tables 6b and 6d, the ex-date average return for AMEX stocks was 1.30 percent, compared to 0.77 percent for NYSE stocks. Table 4 shows results for three equal groups ranked on firm size. Firm size is also positively related to trading frequency for the firms in our sample.[8]

The firm size classification produces the largest divergence across groupings in ex-date returns and in the price drop-off ratio. The smallest firm size category has an average ex-date return of 3.58 percent with a t-statistic of 3.94, 68.3 percent of ex-date returns are positive and the drop-off ratio is 0.73, while the largest firm size category has an average ex-date return of 0.01 percent and a drop-off ratio of 1.012. Thus the largest firm size category shows the full theoretical price adjustment on the ex-date.

To investigate the ex-date effect further, we regressed ex-date returns for individual stocks on the three variables used above to group returns. Results are in Table 5. From these results, only the firm size variable is significant in explaining the ex-date returns for individual stocks. The coefficient for the firm size variable is negative and significant in the simple regression number 1 and in the multiple regression number 4. The bonus size and ex-price variables are insignificant in the simple regressions numbers 2 and 3 respectively, and also in the multiple regression number 4.[9]

IV. Volatility

Ohlson and Penman (1985) and Dravid (1987) test for a change in the post-ex-date variance by computing the proportion, p:

$p = P_r\ (\tilde{R}_2^2 > \tilde{R}_1^2) = 0.5$, under the null hypothesis, and

$\neq 0.5$, under the alternate,

where $\tilde{R}_1$ and $\tilde{R}_2$ are pre- and post-ex-date returns. The proportion is computed by matching pre- and post-ex-date returns, and pooling across firms and dates. Assuming independence across observations, the simple binomial z statistic is used to test the significance of p.

We matched returns symmetrically around the ex-date: the squared return for day +1 was matched firm by firm with that for day -1, and so on during the pre- and post-ex-date periods.[10] Table 6 shows the results.[11] The equal matched squared returns arise from (true) zero returns on both sides of the ex-date. In computing the z statistic, the number of matched equal squared returns were split between the null and alternate hypotheses.[12] The mean squared daily returns around the ex-date are also shown in Figure 2.

For the sample as a whole, the number of cases of $\tilde{R}_2^2 > \tilde{R}_1^2$ is greater than for $\tilde{R}_2^2 < \tilde{R}_1^2$, but the binomial z statistic is not significant. Figure 2 also shows that, apart from the ex-date and perhaps day +1, there is no obvious change in mean squared daily returns. For the bonus size categories in Table 6, only issues $\leq$ 12.5 percent show a change in volatility, an increase after the ex-date, and even this is significant only at the .10 level. Although the sample sizes are small, the result is inconsistent with that of Dravid (1987) who found a decrease in volatility after the ex-date for stock dividends.

V. Discussion and Conclusions

An ex-date event would appear to be non-real and non-informative. Following the announcement date of a bonus issue, there is no information content in the ex-date event and the expected ex-price is the cum-price divided by one plus the percentage distribution. In constructing our sample of 'clean' ex-bonus dates we excluded from the pre- and post-ex-date periods any announcements of bonus issues, earnings or dividends, and any ex-cash dividend events. The results indicate significant positive average returns on the ex-date for smaller bonus sizes, for smaller dollar share prices, and for smaller, less frequently traded firms.

Our results do not support Dravid's interpretation of the 'retained earnings hypothesis'.[13] Almost invariably, bonus share issues in Australia have not been issued out of retained earnings and there is no difference in accounting treatment or tax treatment for small or large bonus distributions. Also, we are unable to find convincing evidence of a change in volatility around the ex-date as has been documented for stock dividends and share splits in the U.S.

One conjecture about ex-date returns is that indivisibilities may inhibit full price adjustment on the ex-date since price changes occur only in multiples of $.125 in the U.S.[14] However, this institutional arrangement is not in place in Australia: price changes occur in multiples of one cent. Also, even if indivisibilities in price changes do inhibit the full theoretical adjustment, it is not clear why the average price adjustment would be biased.

A second conjecture is that managers make distributions to keep the share price within a 'popular trading range'.[15] One piece of evidence from our results could be interpreted as consistent with this. A significant positive relation was found between bonus size and the cum-bonus price per share.[16] However, even if there was a 'popular trading range' effect, it is not clear why this would not occur on the announcement date rather than on the ex-date. Also, this result is equally consistent with other possible interpretations: larger bonus issues occur after firms have experienced larger unusual earnings increases; or, larger bonus issues contain information about larger expected earnings changes and so have larger announcement effects, which occur prior to the ex-date.

One further conjecture is that transactions costs may cause prices to drop on the ex-date less than the theoretical adjustment. Stock distributions, especially smaller distributions, are likely to result in odd lots which attract higher transactions costs. Thus the return on the ex-date may reflect the fact that it is more costly to buy shares immediately before the ex-date because of odd lots created on the ex-date.[17] Our evidence is partially consistent with conjecture: the drop-off ratio on the ex-date is less for smaller bonus issues which presumably result in a larger number of

odd lots. However, this conjecture does not appear to be applicable to the dollar price per share or firm size variables.

We are still left without an adequate explanation of the ex-date returns for bonus share issues in Australia.[18] However, from our results in section III, the firm size variable appears to dominate the other two variables, bonus issue size and ex-bonus price. Small, less frequently traded firms show significant positive average ex-date returns, while large, more frequently traded firms show zero average ex-date returns. Thus the ex-date effect may be another manifestation of the small firm effect on stock returns.

Footnotes

* Thanks are due to J. Hughes, S. Titman and seminar participants at the University of British Columbia for helpful comments on an earlier draft.

1. Ball, Brown and Finn (1977) investigated the announcement effect of bonus share issues in Australia and found positive risk-adjusted returns in the announcement month and in the several prior months, which they attributed to information about anticipated cash flows.

2. Until July 1, 1987, a bonus issue made out of retained earnings was taxable in the hands of shareholders, whereas an issue made out of a share premium or asset revaluation reserve account was not taxable. After July 1, 1987, all bonus issues other than those made out of a share premium reserve will be taxable. None of the bonus issues in our final sample were made out of retained earnings.

3. Following Ball and Finn (1985), days were defined as trading days during which trades actually occurred (i.e., by ignoring days with zero turnover). Prices with a gap of more than five actual trading days between any two trades were not accepted under this procedure.

4. We also stopped going forwards or backwards from the ex-date whenever our five trading day rule was violated. Refer fn. 3.

5. Market adjusted returns, defined as $\tilde{R}_{it} - \tilde{R}_{mt}$, where $\tilde{R}_{it}$ is the return on security i for day t, and R_{mt} is the return on the Statex Actuaries Accumulation Index for the same period, were also calculated. The pattern was similar to that in Table 1. The cumulative average adjusted return at day 0 was 4.60 percent, the average ex-date adjusted return was 1.35 percent with a t-statistic of 3.02, and 56.7 percent of ex-date returns were positive.

6. The returns prior to the ex-date could be due to positive returns in the few days subsequent to the announcement of the bonus issue when this occurred in the 15 day pre-event period. Grinblatt, Masulis and Titman (1984) found significant positive returns for the two days after the announcement of stock dividends in the U.S. In any event, the result is anomalous to market efficiency as commonly defined.

7. Note that the same drop-off ratio (of less than 1.0) results in a higher return for a larger bonus size for two securities with the same cum-bonus price.

8. We calculated a proxy measure of trading frequency as the number of available trading days divided by the number of days on which a trade actually occurred for each firm for the time it was in the investigation

period. Refer to footnote 3 for the definition of daily returns. Thus a firm which traded on each trading day had a measure of 1.0, a firm which traded on one out of two days an average had a measure of 2.0, and so on. The mean trading frequency measure was 1.62. The product moment correlation coefficient for the natural log of firm size and trading frequency was -0.60 and the rank correlation coefficient was -0.75. Larger firms were also the more frequently traded by this proxy measure.

9. We also divided the sample into groups (three by three) on the basis of firm size and bonus size, and firm size and ex-price. While the groupings resulted in a very small number of firms in some cells, firm size again appeared to dominate both bonus size and ex-price.

10. We also matched by an alternative method: the squared return for the first available day in the pre-ex-date period was matched with day +1, the second day in the pre-period with day +2, and so on. Results were virtually the same as those reported.

11. In cases where the return for day t was for more than one trading day, the squared return was divided by the number of trading days. Ball and Bowers (1986) show that the variance of returns for days of the week in Australia correspond closely to a trading day definition.

12. Ohlson and Penman (1985) count equal squared returns with the null hypothesis. However, Dravid (1987) rejects that treatment in favour of the one used here, and supports this with several alternative test statistics.

13. Note that Grinblatt, Masulis and Titman (1984) did not relate the retained earnings hypothesis to ex-date effects. They proposed the retained earnings hypothesis in relation to announcement effects.

14. See Woolridge (1983).

15. For example, Van Horne, Nicol and Wright (1985).

16. The regression equation, with t-statistics in parentheses, is:

$$\begin{array}{l} \text{Bonus Size} = .083 + .055\ \text{Cum-Bonus Price} \\ \qquad\qquad\quad (0.95)\quad (5.02) \qquad\qquad\qquad\qquad R^2 = .18 \end{array}$$

17. This is possible even if there are investors who intend to trade for portfolio reasons and are indifferent between shares which are perfect substitutes. The marginal transactions costs of trading odd lots rather than round lots may be greater than zero for otherwise perfect substitutes.

18. As Eades, Hess and Kim (1984) and Grinblatt, Masulis and Titman (1984) have noted, an ex-date effect for stock distributions questions the tax hypothesis of Elton and Gruber (1970), among others, as an explanation of excess returns on ex-dates for cash dividends.

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Table 1

Average Daily Returns Around the Ex-Dates of Bonus Issues

Day	% Av. R	% Cum. Av. R	t	% > 0	% = 0	% < 0
-14	0.30	0.30	0.77	44.4	17.8	37.8
-13	0.51	0.81	1.74	36.5	44.2	19.3
-12	0.19	1.00	0.48	42.6	36.1	21.3
-11	0.24	1.24	0.79	33.3	40.9	25.8
-10	0.28	1.51	0.90	29.6	38.0	32.4
- 9	0.11	1.62	0.39	32.5	37.5	30.0
- 8	-0.10	1.53	-0.50	31.3	39.8	28.9
- 7	0.57	2.10	2.01	38.4	38.4	23.2
- 6	0.16	2.26	0.66	36.3	37.4	26.3
- 5	0.78	3.04	3.38	44.8	31.3	23.9
- 4	0.43	3.47	1.99	34.0	42.5	23.5
- 3	0.41	3.88	1.63	35.4	40.7	23.9
- 2	0.39	4.27	1.77	29.9	49.6	20.5
- 1	-0.01	4.26	-0.04	27.5	46.7	25.8
0	1.74	6.00	3.88	58.3	5.0	36.7
1	-0.30	5.71	-0.96	30.8	34.2	35.0
2	-0.10	5.61	-0.38	26.7	44.8	28.5
3	0.25	5.86	0.84	24.8	47.8	27.4
4	-0.17	5.69	-0.55	34.5	41.8	23.7
5	-0.22	5.47	-0.79	24.1	42.6	33.3
6	-0.12	5.35	-0.39	25.0	41.7	33.3
7	0.04	5.39	0.23	22.3	51.5	26.2
8	0.16	5.56	0.68	30.3	33.4	30.3
9	0.13	5.68	0.66	31.6	43.2	25.2
10	0.41	6.09	1.53	31.9	40.7	27.4
11	-0.03	6.06	-0.15	29.2	42.7	28.1
12	-0.08	5.98	-0.36	27.0	46.0	27.0
13	-0.23	5.75	-0.98	20.5	43.4	36.1
14	0.31	6.07	1.47	32.9	45.6	21.5
15	0.02	6.09	0.09	33.8	37.8	28.4

Table 2

Ex-Date Returns by Size of Bonus Issue

Bonus Size	N	% Av. R	t	% > 0	Drop-off
≤ 12.5%	39	1.83	2.53	56.4	.796
> 12.5% ≤ 25%	49	2.38	2.76	61.2	.878
> 25%	32	0.64	1.23	56.3	.984
All	120	1.74	3.88	58.3	.880

Table 3

Ex-Date Returns by Dollar Value of Ex-Bonus Price

Ex-Bonus Price	% Av. R	t	% > 0	Drop-off
≤ $1.75	3.12	3.41	60.0	.781
> $1.75 ≤ $3.20	1.13	1.66	57.5	.917
> $3.20	0.96	1.43	57.5	.940

Table 4

Ex-Date Returns by Size of Firm

Firm Size	% Av. R	t	% > 0	Drop-off
≤ $35m	3.58	3.94	68.3	.729
> $35m ≤ $109m	1.58	2.04	59.0	.902
> $109m	0.01	0.02	47.5	1.012

Table 5

Regressions with Ex-Date Return as the Dependent Variable

	Variable[a]					
Regression No.[b]	Intercept	COSIZE	BONSIZE	EXPRICE	Adj. R^2	F
1.	0.058 (4.35)	-0.010 (-3.22)			.073	10.39
2.	0.019 (3.86)		-0.004 (-0.75)		.001	0.56
3.	0.018 (3.03)			-0.001 (-0.22)	.000	0.05
4.	0.059 (4.37)	-0.010 (-3.27)	-0.004 (-0.76)	0.001 (0.68)	.065	3.78

[a] COSIZE: The natural log of the market value of the firm's outstanding shares.
BONSIZE: The size of the bonus issue defined as the proportionate distribution.
EXPRICE: The ex-bonus dollar share price.

[b] Regression coefficients with t-statistics in parenthesis are shown in the table.

Table 6

Squared Daily Return Comparisons in the Pre- and Post-Ex-Date Periods

Bonus Size	$\tilde{R}_2^2 > \tilde{R}_1^2$	$\tilde{R}_2^2 = \tilde{R}^2{}_1$	$\tilde{R}_2^2 < \tilde{R}_1^2$	Binomial z Statistic
All	465	197	414	1.55
$\leq$ 12.5%	164	66	130	1.79
> 12.5% $\leq$ 25%	179	82	166	0.63
> 25%	122	49	118	0.24

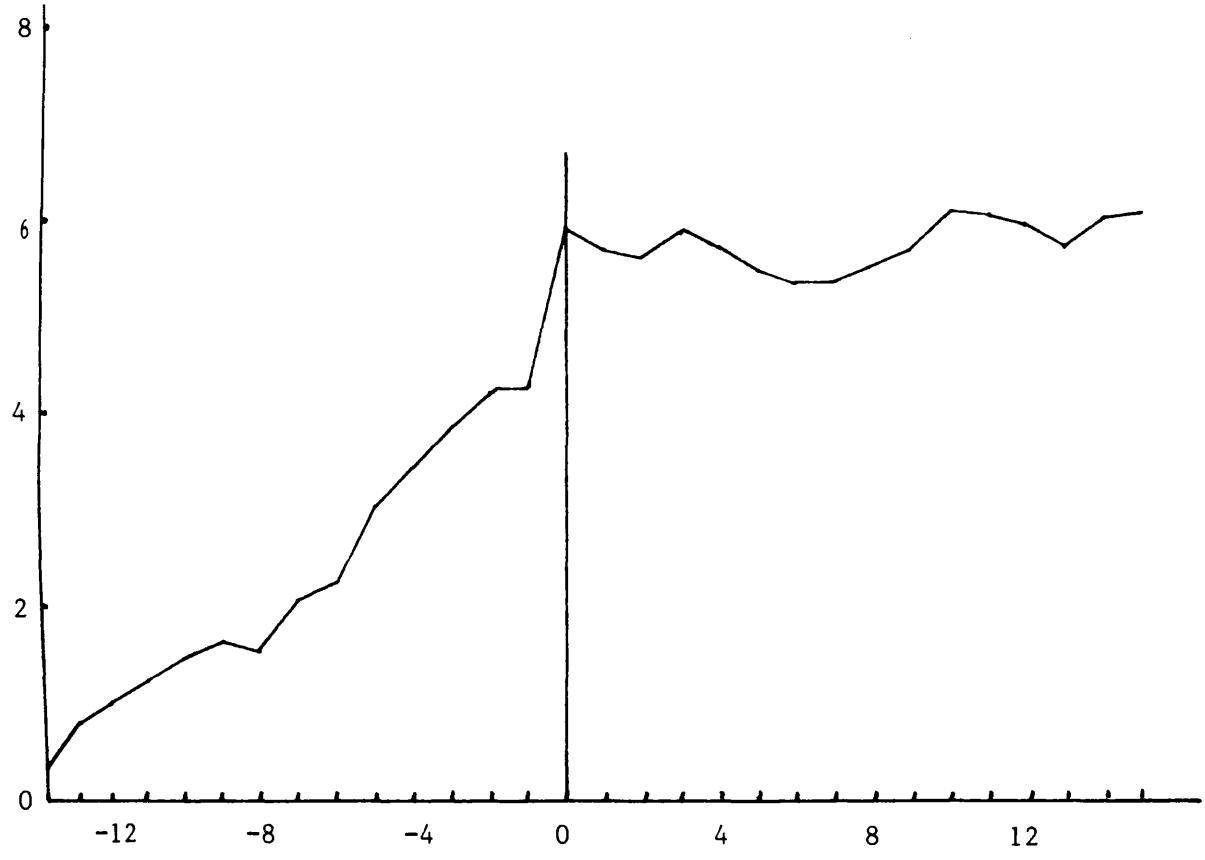

Figure 1: Cumulative Daily Returns Around Ex-Date

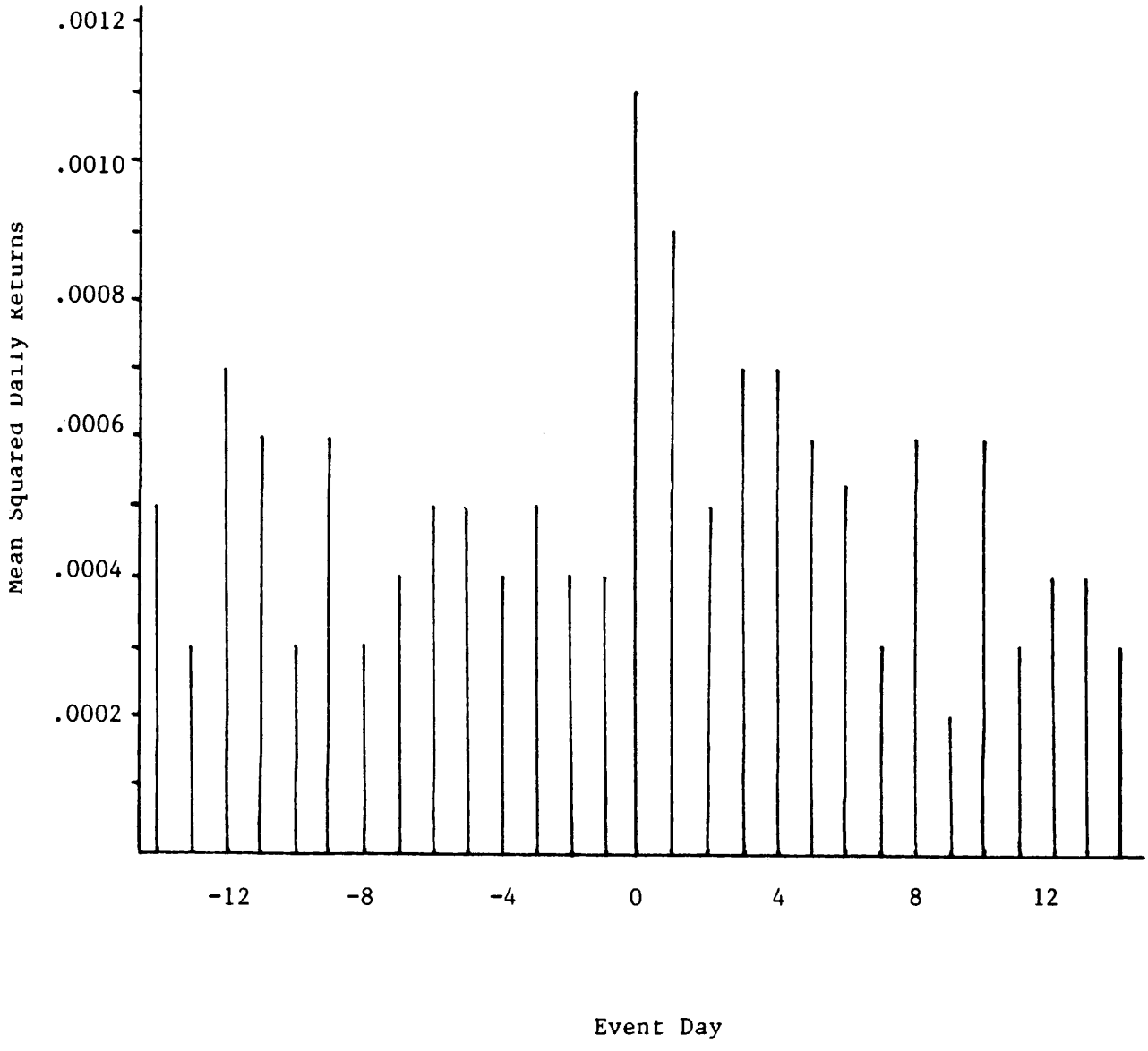

Figure 2: Mean Squared Daily Returns Around Ex-Date